

CHILDREN'S HEALTH

Coal Fire Emissions Curb Children's Growth

Putting more coal on the fire may help to keep off the chill, but it may not help your baby grow. New research found that the 3-year-old children of Czech families who reported using coal for indoor heating were shorter than those whose families used cleaner fuels.¹

Similar to cigarette smoke, the smoke of burning coal contains fine particles, carbon monoxide, benzene, polycyclic aromatic hydrocarbons (PAHs), sulfur dioxide, arsenic, and other toxicants.² "PAHs and particulate matter are associated with reduced intrauterine growth," explains Irva Hertz-Picciotto, a professor of public health sciences at the University of California, Davis, and senior author of the study. "Air pollution has been linked to smaller length and head circumferences at birth, and there is evidence that secondhand [tobacco] smoke can affect the stature of children." Putting the pieces together, she says she and her colleagues became interested in whether indoor coal burning—a common exposure scenario in many countries—might affect children's early postnatal growth.

To investigate this potential link, the researchers examined the height at 36 months of 1,105 Czech children whose mothers had been recruited into the Teplice Pregnancy Outcome Study launched by the Czech government with assistance from the U.S. Environmental Protection Agency. These families were then followed longitudinally in the Children's Health and Air Pollution Study; information was obtained from pediatricians about the children's health and growth at birth

and at 36 months, and the children's mothers responded to questionnaires to determine how families heated their homes, their children's exposure to secondhand tobacco smoke, and other lifestyle variables.

The researchers used the medical history data to determine height-for-age-and-sex *z* scores for the children in homes that did and did not use coal for indoor heating. "These scores reflect the difference between height-for-age-and-sex of a child compared with a reference population, with the units being standard deviations," Hertz-Picciotto explains. "The growth of a child with a negative score is below the mean for the reference population, and the lower the score, the poorer the growth."

Indoor coal combustion was used to heat 10.2% of the children's homes; of these, 77.6% used coal exclusively. The mean height-for-age-and-sex at 36 months for the children in these homes was significantly lower than that of children from non-coal-burning homes. In regression modeling, adjusting for confounders such as birth weight for gestational age and sex, maternal height, and maternal ethnicity, height-for-age-and-sex was found to be significantly associated with indoor coal combustion.

Translating the *z* scores into absolute height differences, 3-year-old boys from indoor coal-burning homes were a mean 1.34 cm shorter, while the girls were a mean 1.3 cm shorter, says first author Rakesh Ghosh, a postdoctoral scholar at UC Davis. "The results showed the effect to be compounded if children were [also] exposed to secondhand cigarette smoke," Ghosh says.

The link between respiratory disease in children and the indoor burning of solid fuels (including coal, wood, and dung) has long been known in the developing world, where homes

The Beat

by Erin E. Dooley

EU Herbal Product Regs Come into Force

On 1 May 2011 new regulations on herbal products came into force in the European Union (EU).¹ The regulations require that all products sold be assessed by the European Medicine and Healthcare products

Regulatory Agency to show they have been manufactured according to strict standards and contain a consistent and clearly marked dose. Each EU member state also is required to establish a registration scheme for manufactured traditional herbal medicines that are suitable for use without medical supervision. Products will only be sanctioned for use for minor medical problems, such as colds, muscular aches and pains, and sleep problems.

Canadian PM Says No to Ban on Asbestos Exports

In late April 2011 Canadian prime minister Stephen Harper said that country would not ban the export of asbestos, despite calls from scientists and health advocacy groups.² Harper cited concerns about market discrimination in defending the decision and pointed out the chrysotile form of asbestos "is permitted internationally under conditions of safe and controlled use,"² although several studies suggest truly controlled use

is impossible to achieve.³ Dozens of other countries have banned all forms of asbestos, a known human carcinogen, but the material is still widely used in developing countries, typically with few controls.³

BREATHE LA Launches Child Asthma Management Program in Port City

BREATHE LA, a nonprofit environmental public health advocacy organization, recently renewed its O24u environmental education and asthma management program in the city of Long Beach.⁴ More than 21% of the children in this port city have asthma. The O24u program trains facilitators in 36 Long Beach elementary schools to educate children and their parents about air pollution causes, effects, and asthma identification and management. BREATHE LA estimates the project could yield a 10–15% decrease in school absenteeism due to asthma and a \$2.7 million savings in avoided asthma-related emergency room visits and hospitalizations.



New EU regulations have taken many herbal remedies off store shelves.



commonly have open hearths and no chimney. But this is the first time growth reduction has been associated with coal burning in the ventilated indoor hearths and furnaces of a developed country. Even with ventilated coal heaters, Hertz-Picciotto says there are two ways children can be exposed: first, when the coal is added, smoke and ash likely enter the room; and second, some fraction of the particles vented outdoors likely land nearby and circulate in areas near the house.

The World Health Organization describes the emissions from solid fuels as the “killer in the kitchen,” claiming them responsible for 1.5 million respiratory illness–related deaths every year, mostly in Southeast Asia and sub-Saharan Africa and predominantly affecting women and children.³ Some research

has also linked the use of such fuels to poorer growth in young children in developing countries,^{4,5} whereas other work has associated indoor coal use with increased lower respiratory tract illnesses.⁶

“The results provide an important public health warning for countries where coal is still burned indoors,” says study co-supervisor Radim Šrám of the Institute of Experimental Medicine AS CR, Prague, Czech Republic. “Moving to cleaner heating systems should be a priority, yet indoor coal use in some countries, such as China, is increasing.”

“It is difficult to disentangle the many influences on child development,” points out Martin McKee, a professor of European public health at the London School of Hygiene & Tropical Medicine, who was not involved with the study. “Many of them cluster together, so that families that are disadvantaged in one way may be exposed to many different hazards. As the authors note, they were unable to assess the extent to which children were exposed to coal smoke, [but nonetheless, this study] raises some important questions.”

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■ REFERENCES

1. Ghosh R, et al. Indoor coal use and early childhood growth. *Arch Pediatr Adolesc Med*; doi:10.1001/archpediatrics.2010.294 [online 7 February 2011].
2. Karr CJ. Adding fuel to the fire. Increasing evidence for developmental toxicity of indoor solid fuel combustion. *Arch Pediatr Adolesc Med*; doi:10.1001/archpediatrics.2011.6 [online 7 Feb 2011].
3. WHO. Fuel for Life: Household Energy and Health. Geneva, Switzerland: World Health Organization (2006). Available: <http://tinyurl.com/6xerngpf> [accessed 5 Apr 2011].
4. Kyu HH, et al. Maternal smoking, biofuel smoke exposure and child height-for-age in seven developing countries. *Int J Epidemiol* 38(5):1342–1350 (2009); doi:10.1093/ije/dyp253.
5. Mishra V, Retherford RD. Does biofuel smoke contribute to anaemia and stunting in early childhood? *Int J Epidemiol* 36(1):117–129 2007; doi:10.1093/ije/dyl234.
6. Baker RJ, et al. Coal home heating and environmental tobacco smoke in relation to lower respiratory illness in Czech children, from birth to 3 years of age. *Environ Health Perspect* 114(7):1126–1132 (2006); doi:10.1289/ehp.8501.

Climate Change: Mastering the Public Health Role

The American Public Health Association (APHA) and the U.S. CDC have released a guidebook for public health practitioners on how to address climate change in their work. The guidebook summarizes a recent series of webinars that brought together climate and health experts and policy makers to discuss climate science, health risk communication, and climate adaptation strategies from a public health perspective.⁵ The guidebook, available for free on the APHA website,⁶ provides examples of how localities are already addressing climate-related health risks to ensure the effects are mitigated for vulnerable populations such as the elderly.

GreenChill Partnership Now Nationwide

Since 2007 food retailers participating in the U.S. EPA's GreenChill partnership have voluntarily agreed to adopt refrigeration



practices to reduce emissions of refrigerants that damage the ozone layer and contribute to the greenhouse effect.⁷ The agency recently announced the partnership now includes 7,000 partner stores across all 50 states, representing 20% of the supermarket industry.⁸ The U.S. EPA

estimates that emissions of refrigerants from partner stores are 50% below the industry average. Extensive best practice guidance at <http://www.epa.gov/greenchill/> advises retailers how to safely transition to new refrigerants, reduce the amounts of refrigerants used, and eliminate refrigerant leaks.

■ REFERENCES

1. Directive 2004/24/EC of the European Parliament and of the Council of 31 March 2004, OJ L 136 of 30 Mar 2004. Available: <http://tinyurl.com/23aorsv> [accessed 12 May 2011].
2. Benzie R. Harper Defends Asbestos Exports Despite Cancer Risks. *Toronto Star*. News section, online edition (26 Apr 2011). Available: <http://tinyurl.com/4yu6gb2> [accessed 12 May 2011].
3. LaDou J, et al. The case for a global ban on asbestos. *Environ Health Perspect* 118(7):897–901 (2010); doi:10.1289/ehp.1002285.
4. BREATHE LA. New Initiative to Address Children's Respiratory Health at Port of Long Beach [press release]. Available: Long Beach, CA: BREATHE California of Los Angeles County (20 Apr 2011). <http://tinyurl.com/3r57eao> [accessed 12 May 2011].
5. Cooney CM. Preparing a people: climate change and public health. *Environ Health Perspect* 119(4):A166–A171 (2011); doi:10.1289/ehp.119-a166.
6. APHA. Climate Change: Mastering the Public Health Role. Washington, DC: American Public Health Association (2011). Available: <http://tinyurl.com/67arelh> [accessed 12 May 2011].
7. Dooley EE. GreenChill Partnership. *Environ Health Perspect* 116(1):A21 (2008); doi:10.1289/ehp.116-a21b.
8. EPA. GreenChill Partnership Reaches All 50 States [press release]. Washington, DC: U.S. Environmental Protection Agency (4 May 2011). Available: <http://tinyurl.com/5wzak7u> [accessed 12 May 2011].